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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,489	02/14/2005	Ryousuke Yamamoto	0310543	2516

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EXAMINER	
RAHIM, AZIM	

ART UNIT	PAPER NUMBER
3744	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/501,489	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	AZIM RAHIM	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-7,10-12,16 and 20-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 5-7, 10-12, 16, and 20-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 6, 7, 10-12, 16, 18-20 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komai (JP 2002-005548 A) in view of Topper et al. (US 6,205,800 B1), Seo et al. (US 6,701,722) and Koide et al. (US 5,229,745).

Regarding claims 1 and 20, Komai teaches a household refrigerator in which a combustible refrigerant is used, having detecting means for detecting a refrigerant leak within the refrigeration system [¶0001; ¶0017]. Komai also teaches that the refrigerator may have an alarm capable of "giving an alarming signal warning against the refrigerant leak when the refrigerant

leak is detected by the detector" [¶0032; ¶0042]. The recitation, "a controller for causing the alarming device to stop giving an alarming signal after a door of a storage compartment is opened," is one of intended use, and as it lends no further structural limitation to the claimed invention, it carries little patentable weight. Komai does, however, disclose a controller (6) capable of "causing the alarming device to stop giving an alarming signal" [Drawing 1, illustrating an electrical connection between controller (6) and abnormality information equipment (10)].

Komai does not expressly teach the stopping of an alarming signal upon the opening of a door of a storage compartment, and a memory device for memorizing a record regarding the refrigerant leak when the power supply is turned on and holding the record when the power supply is turned off, wherein the alarming device gives an additional alarming signal alter a prescribed length of time has passed alter the power supply has been turned back on.

Topper et al. discloses a controller (40) that activates an alarm to audibly/visibly alert a person that the door (54) has been open for a given period of time, based on the door open signal of door sensor (56) [column 4, lines 20-26]. The controller merely receives the open/closed information from the door sensor, determines whether the door has been open longer than a predetermined time period, and supplies a signal to power the alarm if the time period has been exceeded.

One of ordinary skill in the art at the time the invention was made would understand that the controller (40) of Topper et al. could easily be configured (by way of its programming) to terminate the alarm after a predetermined time of zero after the door is opened, thus essentially terminating the alarm when the door is opened. The controller of Komai as explained above,

when operated with the aforementioned teaching of Topper et al. following-the onset of an alarm indicating a refrigerant leak, is capable of performing the recitation of intended use for the claimed controller to stop an alarm signal when the door is opened.

It would have been obvious to one skilled in the art at the time the invention was made to use a controller that is capable of sounding an alarm as a function of the door open/close status, as taught by Topper et al., in the refrigerator of Komai in order to terminate an alarm upon the diffusion of refrigerant gas from the refrigerator compartment into the surrounding air by way of the opening of a refrigerator door.

While Komai does teach a refrigeration cycle with a compressor (8), Komai is silent on the specific components of the refrigeration cycle. It is well known in the art, however, as evidenced by Hirahara et al. (US 5,531,080), to employ a condenser (2), a capillary tube (3), an evaporator (4), and an accumulator (8) or oil separator (20) within a refrigeration system [column 12, lines 3-16; column 13, line 57 ° column 14, line 10].

It would have been obvious to one skilled in the art at the time the invention was made to include the refrigeration components, as taught by Hirahara et al., in the refrigeration system of Komai in order to construct a working refrigeration system.

Also, Koide et al. teach the concept of a device wherein an alarm is activated due to a malfunction of the device [column 2, lines 50-57]. When the device is turned off, the alarm is deactivated [column 4, lines 58-63]. Thus, when the device is turned on again, the alarm is immediately reactivated [column 4, lines 66-68]. Hence, the predetermined time of the alarm being reactivated after the device as re-energized is zero seconds. Although Koide et al. do not explicitly teach a memory being used to store a record of an alarm activation due to a refrigerant

leakage, Seo et al., teach that it is well known in the art to provide a memory used to store a record of a refrigerant leakage, and when a refrigerant leakage has occurred, an information alert is displayed [column 5, lines 16-24].

It would have been obvious to one skilled in the art at the time the invention was made to have modified the refrigerator of Komai and Topper et al. to include the memory device as taught by Seo et al, and the alarm operation of Koide et al. in order to prevent continuous refrigerant leakage, thus preventing contamination of the ambient environment.

Regarding claims 6 and 23, Komai and Topper et al. disclose a household refrigerator with a controller capable of causing the alarming device to stop giving an alarming signal after a door of a storage compartment is opened [see 35 U.S.C. 103(a) rejection to claim 1 above]. The refrigerator disclosed by Topper et al. has only one door (54), which is coupled to the aforementioned door sensor (56) [column 4, lines 11-26]. It is clear by this disclosure, in light of the 35 U.S.C. 103(a) rejection to claim 1 above, that the alarming device is capable of being "caused to stop giving an alarming signal after all the doors are opened." Also, the recitation, "wherein the alarming device is caused to stop giving an alarming signal after the door is left open longer than a prescribed length of time," is one of intended use, and as it lends no further structural limitation to the claimed invention, it is given little patentable weight. The alarming device and controller of Komai, in conjunction with the controller operation teaching and door sensor of Topper et al., are capable of performing such an intended use [see 35 U.S.C. 103(a) rejection to claim 1 above and claim 22 below].

Regarding claims 7 and 24, given the explanation of the refrigerator leakage detector and alarming device as set forth in the 35 U.S.C. 103(a) rejection to claim 1 above and claim 22 below, it would follow that when the alarming device is stopped upon the opening of the door, the alarming device would remain OFF when the door remains open after the minimum time has elapsed that the door must remain open. Therefore, Komai and Topper et al. implicitly teach the limitation, "wherein, after the door is opened and the alarming device sis caused to stop giving an alarming signal, the alarming device is caused to give an alarming signal again in the case that the door is closed while in the state that time for which the door has been left open is shorter than a prescribed length of time, or the alarming device is caused to continue giving no alarming signal in the case that the door is opened while in the state that time for which the door has been left open is longer than a prescribed length of time."

Regarding claims 10 and 16, Komai and Topper et al. render obvious the limitations, "a refrigeration cycle which a compressor, a condenser, a capillary, an evaporator, and an accumulator are connected to, and in which an inflammable refrigerant is included" and "a detector for detecting a leak of the refrigerant" [see 35 U.S.C. 103(a) rejection to claim 1 above]. The alarming device of Komai and Topper et al. is also capable of "giving an alarming signal warning against the refrigerant leak after a prescribed length of time has passed in the case that the refrigerant leak is detected by the detector," as Topper et al. describes an alarm that supplies an alarming signal after a predetermined period of time [see 35 U.S.C. 103(a) rejection to claim 1 above].

Komai and Topper et al. do not expressly disclose a memory device for memorizing a record regarding the refrigerant leak when the power supply is turned on and holding the record when the power supply is turned off, wherein the alarming device gives an additional alarming signal alter a prescribed length of time has passed alter the power supply has been turned back on.

Also, Koide et al. teach the concept of a device wherein an alarm is activated due to a malfunction of the device [column 2, lines 50-57]. When the device is turned off, the alarm is deactivated [column 4, lines 58-63]. Thus, when the device is turned on again, the alarm is immediately reactivated [column 4, lines 66-68]. Hence, the predetermined time of the alarm being reactivated after the device as re-energized is zero seconds. Although Koide et al. do not explicitly teach a memory being used to store a record of an alarm activation due to a refrigerant leakage, Seo et al., teach that it is well known in the art to provide a memory used to store a record of a refrigerant leakage, and when a refrigerant leakage has occurred, an information alert is displayed [column 5, lines 16-24].

It would have been obvious to one skilled in the art at the time the invention was made to have modified the refrigerator of Komai and Topper et al. to include the memory device as taught by Seo et al, and the alarm operation of Koide et al. in order to prevent continuous refrigerant leakage, thus preventing contamination of the ambient environment.

Regarding claim 11, The limitation, "wherein a described length of time is defined as a time which it takes for the concentration of the refrigerant to come to be lower than the concentration of inflammation while the leaked refrigerant diffuses out of a compartment" lends

no further structural limitation to the claimed invention, and is thus given little patentable weight. As such, the controller of Topper et al. is capable of being programmed with such a described length of time, as explained in the 35 U.S.C. 103(a) rejection to claim 1 above. It would have been obvious to one skilled in the art at the time the invention was made to program the controller of Komai and Topper et al. to cease the operation of the alarm after a time period indicative of refrigeration concentration lower than inflammation in order to provide a safer refrigerator leak detection system.

Regarding claims 12 and 22, Komai and Topper et al. render obvious the limitations, "a refrigeration cycle which a compressor, a condenser, a capillary, an evaporator, and an accumulator are connected to, and in which an inflammable refrigerant is included," and "a detector for detecting a leak of the refrigerant" [see 35 U.S.C. 103(a) rejection to claim 1 above]. Topper et al. discloses an alarming device that is controlled by a controller, which operates as a function of preprogrammed timers and ON/OFF commands. It is clear by the explanation of the control unit controlling the alarm of Topper et al. in the 35 U.S.C. 103(a) rejection to claim 1 above, that one of ordinary skill in the art would recognize the operability of the controller to perform the intended use function of controlling "an alarming device for giving an alarming signal warning against the refrigerant leak when a refrigerant leak is no longer detected after the refrigerant diffuses in the case that the refrigerant leak is detected by the detector," by simply changing the controller's operational parameters.

Komai and Topper et al. do not expressly disclose a memory device for memorizing a record regarding the refrigerant leak when the power supply is turned on and holding the record

when the power supply is turned off, wherein the alarming device gives an additional alarming signal alter a prescribed length of time has passed alter the power supply has been turned back on.

Also, Koide et al. teach the concept of a device wherein an alarm is activated due to a malfunction of the device [column 2, lines 50-57]. When the device is turned off, the alarm is deactivated [column 4, lines 58-63]. Thus, when the device is turned on again, the alarm is immediately reactivated [column 4, lines 66-68]. Hence, the predetermined time of the alarm being reactivated after the device as re-energized is zero seconds. Although Koide et al. do not explicitly teach a memory being used to store a record of an alarm activation due to a refrigerant leakage, Seo et al., teach that it is well known in the art to provide a memory used to store a record of a refrigerant leakage, and when a refrigerant leakage has occurred, an information alert is displayed [column 5, lines 16-24].

It would have been obvious to one skilled in the art at the time the invention was made to have modified the refrigerator of Komai and Topper et al. to include the memory device as taught by Seo et al, and the alarm operation of Koide et al. in order to prevent continuous refrigerant leakage, thus preventing contamination of the ambient environment.

3. Claims 5 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US 6,497,113 B1), Kino et al. (JP 2000-121209 A), Komai, Topper et al., Seo et al. and Koide et al.

Regarding claims 5 and 21, Yamada et al. teaches the limitations "a refrigerating space and a freezing space which are formed in a way that the storage space in the main body of the refrigerator is sectioned off by a partition wall" [Abstract], and "a refrigeration cycle... [wherein] the refrigerating space and the freezing space are capable of being controlled independently for refrigeration" [Abstract].

Though Yamada et al. does not disclose the entire refrigeration cycle as claimed by applicant, Hirahara et al. shows that it is well known in the art that a typical refrigeration cycle can include "a compressor, a condenser, capillaries and evaporators for the refrigerating space and the freezing space, and an accumulator," as well as an inflammable refrigerant [see 35 U.S.C. 103(a) rejection to claim 1 above].

Though Yamada et al. is silent on the issues, Kino et al. teaches the use of a detector in both the refrigerating and the freezing space for detecting a refrigerant leak [Fig. 3, (49a), (49b)].

It would have been obvious to one skilled in the art at the time the invention was made to include the refrigerant leakage detectors of Kino et al. into the refrigerator of Yamada et al. in order to detect a refrigerant leak and prevent a dangerous environment.

Also, Yamada et al., Kino et al., Komai and Topper et al. do not expressly disclose a memory device for memorizing a record regarding the refrigerant leak when the power supply is turned on and holding the record when the power supply is turned off, wherein the alarming device gives an additional alarming signal alter a prescribed length of time has passed alter the power supply has been turned back on.

Also, Koide et al. teach the concept of a device wherein an alarm is activated due to a malfunction of the device [column 2, lines 50-57]. When the device is turned off, the alarm is

deactivated [column 4, lines 58-63]. Thus, when the device is turned on again, the alarm is immediately reactivated [column 4, lines 66-68]. Hence, the predetermined time of the alarm being reactivated after the device as re-energized is zero seconds. Although Koide et al. do not explicitly teach a memory being used to store a record of an alarm activation due to a refrigerant leakage, Seo et al., teach that it is well known in the art to provide a memory used to store a record of a refrigerant leakage, and when a refrigerant leakage has occurred, an information alert is displayed [column 5, lines 16-24].

It would have been obvious to one skilled in the art at the time the invention was made to have modified the refrigerator of Yamada et al., Kino et al., Komai and Topper et al. to include the memory device as taught by Seo et al, and the alarm operation of Koide et al. in order to prevent continuous refrigerant leakage, thus preventing contamination of the ambient environment.

Response to Arguments

4. Applicant's arguments with respect to claims 1, 5-7, 10-12, 16, and 20-24 have been considered but are moot in view of the new ground(s) of rejection. Detailed consideration is described above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AZIM RAHIM whose telephone number is (571) 270-1998. The

examiner can normally be reached on Monday - Thursday 7am - 3pm EST and Friday 7am - 9:30am EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AR 4/7/2008

/Frantz F. Jules/
Supervisory Patent Examiner, Art Unit 3744